

WHAT IS CLAIMED IS:

1           1.       A method of displaying multimedia information stored in a multimedia  
2 document on a display, the multimedia information comprising information of a plurality of  
3 types including information of a first type and information of a second type, the method  
4 comprising:

5               displaying a graphical user interface (GUI) on the display;

6               displaying, in a first area of the GUI, a representation of the multimedia  
7 information stored by the multimedia document, the displayed representation of the  
8 multimedia information comprising a representation of information of the first type and a  
9 representation of information of the second type;

10              displaying a first lens covering a first portion of the first area; and

11              displaying, in a second area of the GUI, a representation of multimedia  
12 information displayed in the first portion of the first area, the representation of multimedia  
13 information displayed in the second area comprising a portion of the representation of  
14 information of the first type covered by the first lens and a portion of the representation of  
15 information of the second type covered by the first lens.

1           2.       The method of claim 1 wherein displaying the representation of the  
2 multimedia information stored by the multimedia document in the first area of the GUI  
3 comprises:

4               displaying a first thumbnail image in the first area of the GUI, the first  
5 thumbnail image comprising the representation of information of the first type; and

6               displaying a second thumbnail image in the first area of the GUI, the second  
7 thumbnail image comprising the representation of information of the second type.

1           3.       The method of claim 1 wherein displaying, in the second area of the  
2 GUI, the representation of multimedia information displayed in the first portion of the first  
3 area comprises:

4               displaying the portion of the representation of information of the first type  
5 covered by the first lens in a first panel in the second area of the GUI; and

6               displaying the portion of the representation of information of the second type  
7 covered by the first lens in a second panel in the second area of the GUI.

1           4.     The method of claim 1 wherein displaying, in the second area of the  
2 GUI, the representation of multimedia information displayed in the first portion of the first  
3 area comprises:

4                 determining a first time and a second time associated with the first lens;  
5                 displaying, in the second area of the GUI, a representation of information of  
6 the first type occurring between the first time and the second time associated with the first  
7 lens; and  
8                 displaying, in the second area of the GUI, a representation of information of  
9 the second type occurring between the first time and the second time associated with the first  
10 lens.

1           5.     The method of claim 1 further comprising:  
2                 receiving user input moving the first lens to cover a second portion of the first  
3 area; and  
4                 responsive to the user input, automatically changing the information displayed  
5 in the second area of the GUI such that the representation of multimedia information  
6 displayed in the second area of the GUI corresponds to the representation of multimedia  
7 information included in the second portion of the first area.

1           6.     The method of claim 1 further comprising:  
2                 displaying a second lens covering a first portion of the second area; and  
3                 displaying, in a third area of the GUI, a representation of multimedia  
4 information corresponding to the first portion of the second area, the representation of  
5 multimedia information displayed in the third area comprising a portion of the representation  
6 of information of the first type covered by the second lens and a portion of the representation  
7 of information of the second type covered by the second lens.

1           7.     The method of claim 6 wherein displaying, in the third area of the  
2 GUI, the representation of multimedia information corresponding to the first portion of the  
3 second area comprises:

4                 determining a first time and a second time associated with the second lens;  
5                 displaying, in the third area of the GUI, a representation of information of the  
6 first type occurring between the first time and the second time associated with the second  
7 lens; and

8 displaying, in the third area of the GUI, a representation of information of the  
9 second type occurring between the first time and the second time associated with the second  
10 lens.

1 8. The method of claim 6 wherein:  
2 displaying the representation of the multimedia information stored by the  
3 multimedia document in the first area of the GUI comprises:  
4 displaying a first thumbnail image in the first area of the GUI, the first  
5 thumbnail image comprising the representation of information of the first type; and  
6 displaying a second thumbnail image in the first area of the GUI, the  
7 second thumbnail image comprising the representation of information of the second type;  
8 displaying the representation of multimedia information displayed in the first  
9 portion of the first area in the second area of the GUI comprises:  
10 displaying the portion of the representation of information of the first  
11 type covered by the first lens in a first panel in the second area of the GUI; and  
12 displaying the portion of the representation of information of the  
13 second type covered by the first lens in a second panel in the second area of the GUI; and  
14 displaying the representation of multimedia information corresponding to the  
15 first portion of the second area in the third area of the GUI comprises:  
16 displaying the representation of information of the first type  
17 corresponding to the first portion of the second area of the GUI in a first sub-area of the third  
18 area of the GUI; and  
19 displaying the representation of information of the second type  
20 corresponding to the first portion of the second area of the GUI in a second sub-area of the  
21 third area of the GUI.

1 9. The method of claim 6 further comprising:  
2 receiving a user input moving the second lens to cover a second portion of the  
3 second area; and  
4 responsive to the user input, automatically changing the information displayed  
5 in the third area of the GUI such that the representation of multimedia information displayed  
6 in the third area of the GUI corresponds to the representation of the multimedia information  
7 included in the second portion of the second area.

1 10. The method of claim 6 further comprising:

2 receiving a user input moving the first lens to cover a second portion of the  
3 first area; and  
4 responsive to the user input, automatically:  
5 changing the information displayed in the second area of the GUI such  
6 that the representation of multimedia information displayed in the second area of the GUI  
7 corresponds to the representation of multimedia information included in the second portion of  
8 the first area; and  
9 changing the information displayed in the third area of the GUI such  
10 that the representation of multimedia information displayed in the third area of the GUI  
11 corresponds to the representation of the multimedia information included in the second  
12 portion of the second area.

11. The method of claim 6 further comprising:  
2 displaying a sub-lens covering a portion of the first area of the GUI  
3 corresponding to the first portion of the second area of the GUI covered by the second lens.

12. The method of claim 11 further comprising:  
2 receiving a user input moving the second lens to cover a second portion of the  
3 second area; and  
4 responsive to the user input, automatically changing a position of the sub-lens  
5 to cover a portion of the first area of the GUI corresponding to the second portion of the  
6 second area.

13. The method of claim 1 wherein:  
2 the information of the first type corresponds to video information; and  
3 the representation of the information of the first type comprises one or more  
4 video keyframes extracted from the video information.

14. The method of claim 13 wherein:  
2 the information of the second type corresponds to audio information; and  
3 the representation of information of the second type comprises text  
4 information obtained from transcribing the audio information.

15. The method of claim 13 wherein:  
2 the information of the second type corresponds to closed-caption (CC) text  
3 information; and

the representation of information of the second type comprises text information included in the CC text information.

16. The method of claim 1 further comprising:  
receiving information indicating a user-specified concept of interest; and  
analyzing the multimedia information stored in the multimedia document to identify one or more locations in the multimedia information that are relevant to the user-specified concept of interest;  
wherein displaying the representation of multimedia information in the first area of the GUI comprises annotating the one or more locations in the multimedia information that are relevant to the user-specified concept of interest; and  
wherein displaying, in the second area of the GUI, a representation of multimedia information displayed in the first portion of the first area comprises annotating the one or more locations in the multimedia information that are relevant to the user-specified concept of interest and that are located in the first portion of the first area.

17. The method of claim 1 further comprising:  
receiving input indicating selection of a portion of the multimedia information occurring between a first time and a second time; and  
performing a first operation on the portion of the multimedia information occurring between a first time and a second time.

18. A method of displaying multimedia information stored in a multimedia document on a display, the multimedia information comprising information of a first type and information of a second type, the method comprising:  
displaying a graphical user interface (GUI) on the display;  
displaying, in a first area of the GUI, a representation of the multimedia information stored by the multimedia document occurring between a start time ( $t_s$ ) and an end time ( $t_e$ ) associated with the multimedia document, the displayed representation of the multimedia information comprising a representation of information of the first type occurring between  $t_s$  and  $t_e$  and a representation of information of the second type occurring between  $t_s$  and  $t_e$ , where ( $t_e > t_s$ );  
displaying a first lens emphasizing a portion of the first area of the GUI, the portion of the first area emphasized by the first lens comprising a representation of

13 multimedia information occurring between a first time ( $t_1$ ) and a second time ( $t_2$ ), where ( $t_s \leq$   
14  $t_1 < t_2 \leq t_e$ ); and  
15 displaying, in a second area of the GUI, the representation of multimedia  
16 information occurring between  $t_1$  and  $t_2$ , the representation of multimedia information  
17 displayed in the second area comprising a representation of information of the first type  
18 occurring between  $t_1$  and  $t_2$  and a representation of information of the second type occurring  
19 between  $t_1$  and  $t_2$ .

1 19. The method of claim 18 further comprising:  
2 displaying a second lens emphasizing a portion of the second area of the GUI,  
3 the portion of the second area emphasized by the second lens comprising a representation of  
4 multimedia information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), where ( $t_1 \leq$   
5  $t_3 < t_4 \leq t_2$ ); and

6 displaying, in a third area of the GUI, the representation of multimedia  
7 information occurring between  $t_3$  and  $t_4$ , the representation of multimedia information  
8 displayed in the third area comprising a representation of information of the first type  
9 occurring between  $t_3$  and  $t_4$  and a representation of information of the second type occurring  
10 between  $t_3$  and  $t_4$ .

1 20. The method of claim 19 further comprising:  
2 changing the position of the first lens in response to user input such that the  
3 first lens emphasizes a portion of the first area of the GUI comprising a representation of  
4 multimedia information occurring between a fifth time ( $t_5$ ) and a sixth time ( $t_6$ ), where ( $t_s \leq t_5$   
5  $< t_6 \leq t_e$ ), ( $t_5 \neq t_1$ ), and ( $t_6 \neq t_2$ ); and

6 responsive to the change in the position of the first lens, automatically  
7 displaying, in the second area of the GUI, the representation of multimedia information  
8 occurring between  $t_5$  and  $t_6$ , the representation of multimedia information displayed in the  
9 second area comprising a representation of information of the first type occurring between  $t_5$   
10 and  $t_6$  and a representation of information of the second type occurring between  $t_5$  and  $t_6$ .

1 21. The method of claim 19 further comprising:  
2 changing the position of the second lens in response to user input such that the  
3 second lens emphasizes a portion of the second area of the GUI comprising a representation

4 of multimedia information occurring between a fifth time ( $t_5$ ) and a sixth time ( $t_6$ ), where ( $t_1 \leq$   
5  $t_5 < t_6 \leq t_2$ ), ( $t_5 \neq t_3$ ), and ( $t_6 \neq t_4$ ); and  
6 responsive to the change in the position of the second lens, automatically  
7 displaying, in the third area of the GUI, the representation of multimedia information  
8 occurring between  $t_5$  and  $t_6$ , the representation of multimedia information displayed in the  
9 third area comprising a representation of information of the first type occurring between  $t_5$   
10 and  $t_6$  and a representation of information of the second type occurring between  $t_5$  and  $t_6$ .

1 22. The method of claim 19 further comprising:  
2 displaying a third lens emphasizing a portion of the first area of the GUI  
3 comprising a representation of multimedia information occurring between  $t_3$  and  $t_4$ .

1 23. The method of claim 22 further comprising:  
2 changing the position of the second lens in response to user input such that the  
3 second lens emphasizes a portion of the second area of the GUI comprising a representation  
4 of multimedia information occurring between a fifth time ( $t_5$ ) and a sixth time ( $t_6$ ), where ( $t_1 \leq$   
5  $t_5 < t_6 \leq t_2$ ), ( $t_5 \neq t_3$ ), and ( $t_6 \neq t_4$ ); and  
6 responsive to the change in the position of the second lens, automatically  
7 changing the position of the third lens such that the third lens emphasizes a portion of the first  
8 area of the GUI comprising a representation of multimedia information occurring between  $t_5$   
9 and  $t_6$ .

1 24. The method of claim 18 wherein:  
2 the information of the first type is video information;  
3 the information of the second type is audio information;  
4 the representation of the information of the first type comprises one or more  
5 video keyframes extracted from the video information; and  
6 the representation of information of the second type comprises text  
7 information obtained from transcribing the audio information.

1 25. The method of claim 18 wherein:  
2 the information of the first type is video information;  
3 the information of the second type is closed-caption (CC) text information;  
4 the representation of the information of the first type comprises one or more  
5 video keyframes extracted from the video information; and

6 the representation of the information of the second type comprises text  
7 information included in the CC text information.

1 26. The method of claim 18 further comprising:  
2 receiving information indicating a first topic; and  
3 analyzing the multimedia information stored in the multimedia document to  
4 identify one or more locations in the multimedia information that are relevant to the first  
5 topic;  
6 wherein displaying the representation of the multimedia information stored by  
7 the multimedia document occurring between  $t_s$  and  $t_e$  in the first area of the GUI comprises  
8 highlighting the one or more locations in the multimedia information displayed in the first  
9 area of the GUI; and  
10 wherein displaying the representation of multimedia information occurring  
11 between  $t_1$  and  $t_2$  in the second area of the GUI comprises highlighting the one or more  
12 locations in the multimedia information that occur between times  $t_1$  and  $t_2$ .

1 27. The method of claim 18 further comprising:  
2 receiving input indicating selection of a portion of the multimedia information  
3 occurring between a selection start time and a selection end time; and  
4 performing a first operation on the portion of the multimedia information  
5 occurring between the selection start time and the selection end time.

1 28. A method of displaying multimedia information stored in a multimedia  
2 document on a display, the multimedia information comprising video information and  
3 information of a first type, the method comprising:  
4 displaying a graphical user interface (GUI) on the display;  
5 displaying, in a first section of a first area of the GUI, a first set of one or more  
6 video keyframes extracted from the video information occurring between a start time ( $t_s$ ) and  
7 an end time ( $t_e$ ) associated with the multimedia document, where ( $t_e > t_s$ );  
8 displaying, in a second section of the first area of the GUI, text information  
9 corresponding to the information of the first type occurring between  $t_s$  and  $t_e$ ;  
10 displaying a first lens emphasizing a portion of the first section of the first area  
11 occurring between a first time ( $t_1$ ) and a second time ( $t_2$ ) and a portion of the second section  
12 of the first area occurring between  $t_1$  and  $t_2$ , the emphasized portion of the first section of the  
13 first area comprising a second set of one or more video keyframes extracted from the video



information occurring between  $t_1$  and  $t_2$ , the emphasized portion of the second section of the first area comprising text information corresponding to information of the first type occurring between  $t_1$  and  $t_2$ , wherein the second set of one or more keyframes is a subset of the first set of one or more keyframes and  $(t_s \leq t_1 < t_2 \leq t_e)$ ;

displaying the second set of one or more keyframes in a first section of a second area of the GUI; and

displaying text information corresponding to the information of the first type occurring between  $t_1$  and  $t_2$  in a second section of the second area of the GUI.

29. The method of claim 28 further comprising:

displaying a second lens emphasizing a portion of the first section of the second area and a portion of the second section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset of the second set of one or more video keyframes and  $(t_1 \leq t_3 < t_4 \leq t_2)$ ;

displaying a keyframe from the third set of one or more keyframes in a first section of a third area of the GUI; and

displaying text information corresponding to the information of the first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI.

30. The method of claim 28 further comprising:

displaying a second lens emphasizing a portion of the first section of the second area and a portion of the second section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset of the second set of one or more video keyframes and  $(t_1 \leq t_3 < t_4 \leq t_2)$ ;

outputting video information starting from  $t_3$  or from  $t_4$  or from a time between  $t_3$  and  $t_4$  in a first section of a third area of the GUI; and

12 displaying text information corresponding to the information of the first type  
13 occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI.

1 31. The method of claim 28 wherein the information of the first type is  
2 audio information, and the text information corresponding to the information of the first type  
3 is obtained from transcribing the audio information.

1 32. The method of claim 28 wherein the information of the first type is  
2 closed-caption (CC) text information, and the text information corresponding to the  
3 information of the first type is extracted from the CC text information.

1 33. The method of claim 28 wherein the multimedia information stored by  
2 the multimedia document further comprises slides information, the method comprising:  
3 displaying, in a third section of the first area of the GUI, a first set of one or  
4 more slides extracted from the slides information occurring between  $t_s$  and  $t_e$ , wherein the  
5 first lens emphasizes a portion of the third section of the first area comprising a second set of  
6 one or more slides extracted from the slides information occurring between  $t_1$  and  $t_2$ , the  
7 second set of one or more slides is a subset of the first set of one or more slides; and  
8 displaying the second set of one or more slides in a third section of the second  
9 area of the GUI

1 34. The method of claim 33 further comprising:  
2 displaying a second lens emphasizing a portion of the first section of the  
3 second area, a portion of the second section of the second area, and a portion of the third  
4 section of the second area, the emphasized portion of the first section of the second area  
5 comprising a third set of one or more video keyframes extracted from the video information  
6 occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the  
7 second section of the second area comprising text information corresponding to information  
8 of the first type occurring between  $t_3$  and  $t_4$ , the emphasized portion of the third section of the  
9 second area comprising a third set of one or more slides extracted from the slides information  
10 occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset  
11 of the second set of one or more video keyframes, the third set of one or more slides is a  
12 subset of the second set of one or more slides, and ( $t_1 \leq t_3 < t_4 \leq t_2$ );  
13 displaying at least one keyframe from the third set of one or more video  
14 keyframes in a first section of a third area of the GUI;

15 displaying text information corresponding to the information of the first type  
16 occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI; and  
17 displaying at least one slide from the third set of one or more slides in a third  
18 section of the third area of the GUI.

1 35. The method of claim 28 wherein the multimedia information stored by  
2 the multimedia document further comprises whiteboard images information, the method  
3 comprising:

4 displaying, in a third section of the first area of the GUI, a first set of one or  
5 more whiteboard images extracted from the whiteboard images information occurring  
6 between  $t_s$  and  $t_e$ , wherein the first lens emphasizes a portion of the third section of the first  
7 area comprising a second set of one or more whiteboard images extracted from the  
8 whiteboard images information occurring between  $t_1$  and  $t_2$ , the second set of one or more  
9 whiteboard images is a subset of the first set of one or more whiteboard images; and  
10 displaying the second set of one or more whiteboard images in a third section  
11 of the second area of the GUI.

1 36. The method of claim 35 further comprising:  
2 displaying a second lens emphasizing a portion of the first section of the  
3 second area, a portion of the second section of the second area, and a portion of the third  
4 section of the second area, the emphasized portion of the first section of the second area  
5 comprising a third set of one or more video keyframes extracted from the video information  
6 occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the  
7 second section of the second area comprising text information corresponding to information  
8 of the first type occurring between  $t_3$  and  $t_4$ , the emphasized portion of the third section of the  
9 second area comprising a third set of one or more whiteboard images extracted from the  
10 whiteboard images information occurring between  $t_3$  and  $t_4$ , wherein the third set of one or  
11 more video keyframes is a subset of the second set of one or more video keyframes, the third  
12 set of one or more whiteboard images is a subset of the second set of one or more whiteboard  
13 images, and ( $t_1 \leq t_3 < t_4 \leq t_2$ );

14 displaying at least one keyframe from the third set of one or more video  
15 keyframes in a first section of a third area of the GUI;

16 displaying text information corresponding to the information of the first type  
17 occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI; and

18 displaying a whiteboard images from the third set of one or more whiteboard  
19 images in a third section of the third area of the GUI.

1 37. A system for displaying multimedia information stored in a multimedia  
2 document on a display, the multimedia information comprising information of a plurality of  
3 types including information of a first type and information of a second type, the system  
4 comprising:

5 means for displaying a graphical user interface (GUI) on the display;

6 means for displaying, in a first area of the GUI, a representation of the  
7 multimedia information stored by the multimedia document, the displayed representation of  
8 the multimedia information comprising a representation of information of the first type and a  
9 representation of information of the second type;

10 means for displaying a first lens covering a first portion of the first area; and

11 means for displaying, in a second area of the GUI, a representation of  
12 multimedia information displayed in the first portion of the first area, the representation of  
13 multimedia information displayed in the second area comprising a portion of the  
14 representation of information of the first type covered by the first lens and a portion of the  
15 representation of information of the second type covered by the first lens.

1 38. A system for displaying multimedia information stored in a multimedia  
2 document on a display, the multimedia information comprising information of a first type and  
3 information of a second type, the system comprising:

4 means for displaying a graphical user interface (GUI) on the display;

5 means for displaying, in a first area of the GUI, a representation of the  
6 multimedia information stored by the multimedia document occurring between a start time  
7 ( $t_s$ ) and an end time ( $t_e$ ) associated with the multimedia document, the displayed  
8 representation of the multimedia information comprising a representation of information of  
9 the first type occurring between  $t_s$  and  $t_e$  and a representation of information of the second  
10 type occurring between  $t_s$  and  $t_e$ , where ( $t_e > t_s$ );

11 means for displaying a first lens emphasizing a portion of the first area of the  
12 GUI, the portion of the first area emphasized by the first lens comprising a representation of  
13 multimedia information occurring between a first time ( $t_1$ ) and a second time ( $t_2$ ), where ( $t_s \leq$   
14  $t_1 < t_2 \leq t_e$ ); and

means for displaying, in a second area of the GUI, the representation of multimedia information occurring between  $t_1$  and  $t_2$ , the representation of multimedia information displayed in the second area comprising a representation of information of the first type occurring between  $t_1$  and  $t_2$  and a representation of information of the second type occurring between  $t_1$  and  $t_2$ .

39. A system for displaying multimedia information stored in a multimedia document on a display, the multimedia information comprising video information and information of a first type, the system comprising:

means for displaying a graphical user interface (GUI) on the display;

means for displaying, in a first section of a first area of the GUI, a first set of one or more video keyframes extracted from the video information occurring between a start time ( $t_s$ ) and an end time ( $t_e$ ) associated with the multimedia document, where ( $t_e > t_s$ );

means for displaying, in a second section of the first area of the GUI, text information corresponding to the information of the first type occurring between  $t_s$  and  $t_e$ ;

means for displaying a first lens emphasizing a portion of the first section of the first area occurring between a first time ( $t_1$ ) and a second time ( $t_2$ ) and a portion of the second section of the first area occurring between  $t_1$  and  $t_2$ , the emphasized portion of the first section of the first area comprising a second set of one or more video keyframes extracted from the video information occurring between  $t_1$  and  $t_2$ , the emphasized portion of the second section of the first area comprising text information corresponding to information of the first type occurring between  $t_1$  and  $t_2$ , wherein the second set of one or more keyframes is a subset of the first set of one or more keyframes and ( $t_s \leq t_1 < t_2 \leq t_e$ );

means for displaying the second set of one or more keyframes in a first section of a second area of the GUI; and

means for displaying text information corresponding to the information of the first type occurring between  $t_1$  and  $t_2$  in a second section of the second area of the GUI.

40. A computer program product stored on a computer-readable storage medium for displaying multimedia information stored in a multimedia document on a display, the multimedia information comprising information of a plurality of types including information of a first type and information of a second type, the computer program product comprising:

code for displaying a graphical user interface (GUI) on the display;

7 code for displaying, in a first area of the GUI, a representation of the  
8 multimedia information stored by the multimedia document, the displayed representation of  
9 the multimedia information comprising a representation of information of the first type and a  
10 representation of information of the second type;  
11 code for displaying a first lens covering a first portion of the first area; and  
12 code for displaying, in a second area of the GUI, a representation of  
13 multimedia information displayed in the first portion of the first area, the representation of  
14 multimedia information displayed in the second area comprising a portion of the  
15 representation of information of the first type covered by the first lens and a portion of the  
16 representation of information of the second type covered by the first lens.

1 41. The computer program product of claim 40 wherein the code for  
2 displaying the representation of the multimedia information stored by the multimedia  
3 document in the first area of the GUI comprises:  
4 code for displaying a first thumbnail image in the first area of the GUI, the  
5 first thumbnail image comprising the representation of information of the first type; and  
6 code for displaying a second thumbnail image in the first area of the GUI, the  
7 second thumbnail image comprising the representation of information of the second type.

1 42. The computer program product of claim 40 wherein the code for  
2 displaying, in the second area of the GUI, the representation of multimedia information  
3 displayed in the first portion of the first area comprises:  
4 code for displaying the portion of the representation of information of the first  
5 type covered by the first lens in a first panel in the second area of the GUI; and  
6 code for displaying the portion of the representation of information of the  
7 second type covered by the first lens in a second panel in the second area of the GUI.

1 43. The computer program product of claim 40 wherein the code for  
2 displaying, in the second area of the GUI, the representation of multimedia information  
3 displayed in the first portion of the first area comprises:  
4 code for determining a first time and a second time associated with the first  
5 lens;  
6 code for displaying, in the second area of the GUI, a representation of  
7 information of the first type occurring between the first time and the second time associated  
8 with the first lens; and

9 code for displaying, in the second area of the GUI, a representation of  
10 information of the second type occurring between the first time and the second time  
11 associated with the first lens.

1 44. The computer program product of claim 40 further comprising:  
2 code for receiving user input moving the first lens to cover a second portion of  
3 the first area; and  
4 code for responsive to the user input, automatically changing the information  
5 displayed in the second area of the GUI such that the representation of multimedia  
6 information displayed in the second area of the GUI corresponds to the representation of  
7 multimedia information included in the second portion of the first area.

1 45. The computer program product of claim 40 further comprising:  
2 code for displaying a second lens covering a first portion of the second area;  
3 and  
4 code for displaying, in a third area of the GUI, a representation of multimedia  
5 information corresponding to the first portion of the second area, the representation of  
6 multimedia information displayed in the third area comprising a portion of the representation  
7 of information of the first type covered by the second lens and a portion of the representation  
8 of information of the second type covered by the second lens.

1 46. The computer program product of claim 45 wherein the code for  
2 displaying, in the third area of the GUI, the representation of multimedia information  
3 corresponding to the first portion of the second area comprises:  
4 code for determining a first time and a second time associated with the second  
5 lens;  
6 code for displaying, in the third area of the GUI, a representation of  
7 information of the first type occurring between the first time and the second time associated  
8 with the second lens; and  
9 code for displaying, in the third area of the GUI, a representation of  
10 information of the second type occurring between the first time and the second time  
11 associated with the second lens.

1 47. The computer program product of claim 45 wherein:

2 the code for displaying the representation of the multimedia information stored  
3 by the multimedia document in the first area of the GUI comprises:

4 code for displaying a first thumbnail image in the first area of the GUI,  
5 the first thumbnail image comprising the representation of information of the first type; and  
6 code for displaying a second thumbnail image in the first area of the  
7 GUI, the second thumbnail image comprising the representation of information of the second  
8 type;

9 the code for displaying the representation of multimedia information displayed  
10 in the first portion of the first area in the second area of the GUI comprises:

11 code for displaying the portion of the representation of information of  
12 the first type covered by the first lens in a first panel in the second area of the GUI; and

13 code for displaying the portion of the representation of information of  
14 the second type covered by the first lens in a second panel in the second area of the GUI; and

15 the code for displaying the representation of multimedia information  
16 corresponding to the first portion of the second area in the third area of the GUI comprises:

17 code for displaying the representation of information of the first type  
18 corresponding to the first portion of the second area of the GUI in a first sub-area of the third  
19 area of the GUI; and

20 code for displaying the representation of information of the second  
21 type corresponding to the first portion of the second area of the GUI in a second sub-area of  
22 the third area of the GUI.

1 48. The computer program product of claim 45 further comprising:

2 code for receiving a user input moving the second lens to cover a second  
3 portion of the second area; and

4 responsive to the user input, code for automatically changing the information  
5 displayed in the third area of the GUI such that the representation of multimedia information  
6 displayed in the third area of the GUI corresponds to the representation of the multimedia  
7 information included in the second portion of the second area.

1 49. The computer program product of claim 45 further comprising:

2 code for receiving a user input moving the first lens to cover a second portion  
3 of the first area; and

4 responsive to the user input, code for automatically:



5 changing the information displayed in the second area of the GUI such  
6 that the representation of multimedia information displayed in the second area of the GUI  
7 corresponds to the representation of multimedia information included in the second portion of  
8 the first area; and

9 changing the information displayed in the third area of the GUI such  
10 that the representation of multimedia information displayed in the third area of the GUI  
11 corresponds to the representation of the multimedia information included in the second  
12 portion of the second area.

1 50. The computer program product of claim 45 further comprising:  
2 code for displaying a sub-lens covering a portion of the first area of the GUI  
3 corresponding to the first portion of the second area of the GUI covered by the second lens.

1 51. The computer program product of claim 50 further comprising:  
2 code for receiving a user input moving the second lens to cover a second  
3 portion of the second area; and  
4 responsive to the user input, code for automatically changing a position of the  
5 sub-lens to cover a portion of the first area of the GUI corresponding to the second portion of  
6 the second area.

1 52. The computer program product of claim 40 wherein:  
2 the information of the first type corresponds to video information; and  
3 the representation of the information of the first type comprises one or more  
4 video keyframes extracted from the video information.

1 53. The computer program product of claim 52 wherein:  
2 the information of the second type corresponds to audio information; and  
3 the representation of information of the second type comprises text  
4 information obtained from transcribing the audio information.

1 54. The computer program product of claim 52 wherein:  
2 the information of the second type corresponds to closed-caption (CC) text  
3 information; and  
4 the representation of information of the second type comprises text  
5 information included in the CC text information.

1           55.     The computer program product of claim 40 further comprising:  
2           code for receiving information indicating a user-specified concept of interest;  
3     and  
4           code for analyzing the multimedia information stored in the multimedia  
5     document to identify one or more locations in the multimedia information that are relevant to  
6     the user-specified concept of interest;  
7           wherein the code for displaying the representation of multimedia information  
8     in the first area of the GUI comprises code for annotating the one or more locations in the  
9     multimedia information that are relevant to the user-specified concept of interest; and  
10          wherein the code for displaying, in the second area of the GUI, a  
11     representation of multimedia information displayed in the first portion of the first area  
12     comprises code for annotating the one or more locations in the multimedia information that  
13     are relevant to the user-specified concept of interest and that are located in the first portion of  
14     the first area.

1           56.     The computer program product of claim 40 further comprising:  
2           code for receiving input indicating selection of a portion of the multimedia  
3     information occurring between a first time and a second time; and  
4           code for performing a first operation on the portion of the multimedia  
5     information occurring between a first time and a second time.

1           57.     A computer program product stored on a computer-readable storage  
2     medium for displaying multimedia information stored in a multimedia document on a  
3     display, the multimedia information comprising information of a first type and information of  
4     a second type, the computer program product comprising:  
5           code for displaying a graphical user interface (GUI) on the display;  
6           code for displaying, in a first area of the GUI, a representation of the  
7     multimedia information stored by the multimedia document occurring between a start time  
8     ( $t_s$ ) and an end time ( $t_e$ ) associated with the multimedia document, the displayed  
9     representation of the multimedia information comprising a representation of information of  
10    the first type occurring between  $t_s$  and  $t_e$  and a representation of information of the second  
11    type occurring between  $t_s$  and  $t_e$ , where ( $t_e > t_s$ );  
12          code for displaying a first lens emphasizing a portion of the first area of the  
13    GUI, the portion of the first area emphasized by the first lens comprising a representation of

14 multimedia information occurring between a first time ( $t_1$ ) and a second time ( $t_2$ ), where ( $t_s \leq$   
15  $t_1 < t_2 \leq t_e$ ); and  
16 code for displaying, in a second area of the GUI, the representation of  
17 multimedia information occurring between  $t_1$  and  $t_2$ , the representation of multimedia  
18 information displayed in the second area comprising a representation of information of the  
19 first type occurring between  $t_1$  and  $t_2$  and a representation of information of the second type  
20 occurring between  $t_1$  and  $t_2$ .

1 58. The computer program product of claim 57 further comprising:  
2 code for displaying a second lens emphasizing a portion of the second area of  
3 the GUI, the portion of the second area emphasized by the second lens comprising a  
4 representation of multimedia information occurring between a third time ( $t_3$ ) and a fourth  
5 time ( $t_4$ ), where ( $t_1 \leq t_3 < t_4 \leq t_2$ ); and  
6 code for displaying, in a third area of the GUI, the representation of  
7 multimedia information occurring between  $t_3$  and  $t_4$ , the representation of multimedia  
8 information displayed in the third area comprising a representation of information of the first  
9 type occurring between  $t_3$  and  $t_4$  and a representation of information of the second type  
10 occurring between  $t_3$  and  $t_4$ .

1 59. The computer program product of claim 58 further comprising:  
2 code for changing the position of the first lens in response to user input such  
3 that the first lens emphasizes a portion of the first area of the GUI comprising a  
4 representation of multimedia information occurring between a fifth time ( $t_5$ ) and a sixth time  
5 ( $t_6$ ), where ( $t_s \leq t_5 < t_6 \leq t_e$ ), ( $t_5 \neq t_1$ ), and ( $t_6 \neq t_2$ ); and  
6 responsive to the change in the position of the first lens, code for automatically  
7 displaying, in the second area of the GUI, the representation of multimedia information  
8 occurring between  $t_5$  and  $t_6$ , the representation of multimedia information displayed in the  
9 second area comprising a representation of information of the first type occurring between  $t_5$   
10 and  $t_6$  and a representation of information of the second type occurring between  $t_5$  and  $t_6$ .

1 60. The computer program product of claim 58 further comprising:  
2 code for changing the position of the second lens in response to user input  
3 such that the second lens emphasizes a portion of the second area of the GUI comprising a

representation of multimedia information occurring between a fifth time ( $t_5$ ) and a sixth time ( $t_6$ ), where ( $t_1 \leq t_5 < t_6 \leq t_2$ ), ( $t_5 \neq t_3$ ), and ( $t_6 \neq t_4$ ); and

code for responsive to the change in the position of the second lens, automatically displaying, in the third area of the GUI, the representation of multimedia information occurring between  $t_5$  and  $t_6$ , the representation of multimedia information displayed in the third area comprising a representation of information of the first type occurring between  $t_5$  and  $t_6$  and a representation of information of the second type occurring between  $t_5$  and  $t_6$ .

61. The computer program product of claim 58 further comprising:  
code for displaying a third lens emphasizing a portion of the first area of the GUI comprising a representation of multimedia information occurring between  $t_3$  and  $t_4$ .

62. The computer program product of claim 61 further comprising:  
code for changing the position of the second lens in response to user input such that the second lens emphasizes a portion of the second area of the GUI comprising a representation of multimedia information occurring between a fifth time ( $t_5$ ) and a sixth time ( $t_6$ ), where ( $t_1 \leq t_5 < t_6 \leq t_2$ ), ( $t_5 \neq t_3$ ), and ( $t_6 \neq t_4$ ); and

code for responsive to the change in the position of the second lens, automatically changing the position of the third lens such that the third lens emphasizes a portion of the first area of the GUI comprising a representation of multimedia information occurring between  $t_5$  and  $t_6$ .

63. The computer program product of claim 57 wherein:  
the information of the first type is video information;  
the information of the second type is audio information;  
the representation of the information of the first type comprises one or more video keyframes extracted from the video information; and  
the representation of information of the second type comprises text information obtained from transcribing the audio information.

64. The computer program product of claim 57 wherein:  
the information of the first type is video information;  
the information of the second type is closed-caption (CC) text information;

4 the representation of the information of the first type comprises one or more  
5 video keyframes extracted from the video information; and  
6 the representation of the information of the second type comprises text  
7 information included in the CC text information.

1 65. The computer program product of claim 57 further comprising:  
2 code for receiving information indicating a first topic; and  
3 code for analyzing the multimedia information stored in the multimedia  
4 document to identify one or more locations in the multimedia information that are relevant to  
5 the first topic;  
6 wherein the code for displaying the representation of the multimedia  
7 information stored by the multimedia document occurring between  $t_s$  and  $t_e$  in the first area of  
8 the GUI comprises code for highlighting the one or more locations in the multimedia  
9 information displayed in the first area of the GUI; and  
10 wherein the code for displaying the representation of multimedia information  
occurring between  $t_1$  and  $t_2$  in the second area of the GUI comprises code for highlighting the  
one or more locations in the multimedia information that occur between times  $t_1$  and  $t_2$ .

1 66. The computer program product of claim 57 further comprising:  
2 code for receiving input indicating selection of a portion of the multimedia  
3 information occurring between a selection start time and a selection end time; and  
4 code for performing a first operation on the portion of the multimedia  
5 information occurring between the selection start time and the selection end time.

1 67. A computer program product stored on a computer-readable storage  
2 medium for displaying multimedia information stored in a multimedia document on a  
3 display, the multimedia information comprising video information and information of a first  
4 type, the computer program product comprising:  
5 code for displaying a graphical user interface (GUI) on the display;  
6 code for displaying, in a first section of a first area of the GUI, a first set of  
7 one or more video keyframes extracted from the video information occurring between a start  
8 time ( $t_s$ ) and an end time ( $t_e$ ) associated with the multimedia document, where ( $t_e > t_s$ );  
9 code for displaying, in a second section of the first area of the GUI, text  
10 information corresponding to the information of the first type occurring between  $t_s$  and  $t_e$ ;

code for displaying a first lens emphasizing a portion of the first section of the first area occurring between a first time ( $t_1$ ) and a second time ( $t_2$ ) and a portion of the second section of the first area occurring between  $t_1$  and  $t_2$ , the emphasized portion of the first section of the first area comprising a second set of one or more video keyframes extracted from the video information occurring between  $t_1$  and  $t_2$ , the emphasized portion of the second section of the first area comprising text information corresponding to information of the first type occurring between  $t_1$  and  $t_2$ , wherein the second set of one or more keyframes is a subset of the first set of one or more keyframes and ( $t_s \leq t_1 < t_2 \leq t_e$ );

code for displaying the second set of one or more keyframes in a first section of a second area of the GUI; and

code for displaying text information corresponding to the information of the first type occurring between  $t_1$  and  $t_2$  in a second section of the second area of the GUI.

68. The computer program product of claim 67 further comprising:

code for displaying a second lens emphasizing a portion of the first section of the second area and a portion of the second section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset of the second set of one or more video keyframes and ( $t_1 \leq t_3 < t_4 \leq t_2$ );

code for displaying a keyframe from the third set of one or more keyframes in a first section of a third area of the GUI; and

code for displaying text information corresponding to the information of the first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI.

69. The computer program product of claim 67 further comprising:

code for displaying a second lens emphasizing a portion of the first section of the second area and a portion of the second section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ ,

wherein the third set of one or more video keyframes is a subset of the second set of one or more video keyframes and  $(t_1 \leq t_3 < t_4 \leq t_2)$ ;  
code for outputting video information starting from  $t_3$  or from  $t_4$  or from a time between  $t_3$  and  $t_4$  in a first section of a third area of the GUI; and  
code for displaying text information corresponding to the information of the first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI.

70. The computer program product of claim 67 wherein the information of the first type is audio information, and the text information corresponding to the information of the first type is obtained from transcribing the audio information.

71. The computer program product of claim 67 wherein the information of the first type is closed-caption (CC) text information, and the text information corresponding to the information of the first type is extracted from the CC text information.

72. The computer program product of claim 67 wherein the multimedia information stored by the multimedia document further comprises slides information, the computer program product further comprising:  
code for displaying, in a third section of the first area of the GUI, a first set of one or more slides extracted from the slides information occurring between  $t_s$  and  $t_e$ , wherein the first lens emphasizes a portion of the third section of the first area comprising a second set of one or more slides extracted from the slides information occurring between  $t_1$  and  $t_2$ , the second set of one or more slides is a subset of the first set of one or more slides; and  
code for displaying the second set of one or more slides in a third section of the second area of the GUI

73. The computer program product of claim 72 further comprising:  
code for displaying a second lens emphasizing a portion of the first section of the second area, a portion of the second section of the second area, and a portion of the third section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ , the emphasized portion of the third section of the second area comprising a third set of one or more slides extracted from the slides information

10 occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset  
11 of the second set of one or more video keyframes, the third set of one or more slides is a  
12 subset of the second set of one or more slides, and ( $t_1 \leq t_3 < t_4 \leq t_2$ );  
13 code for displaying at least one keyframe from the third set of one or more  
14 video keyframes in a first section of a third area of the GUI;  
15 code for displaying text information corresponding to the information of the  
16 first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI; and  
17 displaying at least one slide from the third set of one or more slides in a third  
18 section of the third area of the GUI.

1 74. The computer program product of claim 67 wherein the multimedia  
2 information stored by the multimedia document further comprises whiteboard images  
3 information, the computer program product further comprising:  
4 code for displaying, in a third section of the first area of the GUI, a first set of  
5 one or more whiteboard images extracted from the whiteboard images information occurring  
6 between  $t_s$  and  $t_e$ , wherein the first lens emphasizes a portion of the third section of the first  
7 area comprising a second set of one or more whiteboard images extracted from the  
8 whiteboard images information occurring between  $t_1$  and  $t_2$ , the second set of one or more  
9 whiteboard images is a subset of the first set of one or more whiteboard images; and  
10 code for displaying the second set of one or more whiteboard images in a third  
11 section of the second area of the GUI.

1 75. The computer program product of claim 74 further comprising:  
2 code for displaying a second lens emphasizing a portion of the first section of  
3 the second area, a portion of the second section of the second area, and a portion of the third  
4 section of the second area, the emphasized portion of the first section of the second area  
5 comprising a third set of one or more video keyframes extracted from the video information  
6 occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the  
7 second section of the second area comprising text information corresponding to information  
8 of the first type occurring between  $t_3$  and  $t_4$ , the emphasized portion of the third section of the  
9 second area comprising a third set of one or more whiteboard images extracted from the  
10 whiteboard images information occurring between  $t_3$  and  $t_4$ , wherein the third set of one or  
11 more video keyframes is a subset of the second set of one or more video keyframes, the third



set of one or more whiteboard images is a subset of the second set of one or more whiteboard images, and ( $t_1 \leq t_3 < t_4 \leq t_2$ );

code for displaying at least one keyframe from the third set of one or more video keyframes in a first section of a third area of the GUI;

code for displaying text information corresponding to the information of the first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI; and

code for displaying a whiteboard images from the third set of one or more whiteboard images in a third section of the third area of the GUI.

76. A system for displaying multimedia information stored in a multimedia document, the multimedia information comprising information of a plurality of types including information of a first type and information of a second type, the system comprising:

a display;

a processor; and

a memory coupled to the processor, the memory configured to store a plurality of code modules for execution by the processor, the plurality of code modules comprising:

a code module for displaying a graphical user interface (GUI) on the

display;

a code module for displaying, in a first area of the GUI, a

representation of the multimedia information stored by the multimedia document, the

displayed representation of the multimedia information comprising a representation of

information of the first type and a representation of information of the second type;

a code module for displaying a first lens covering a first portion of the first area; and

a code module for displaying, in a second area of the GUI, a

representation of multimedia information displayed in the first portion of the first area, the

representation of multimedia information displayed in the second area comprising a portion

of the representation of information of the first type covered by the first lens and a portion of

the representation of information of the second type covered by the first lens.

77. The system of claim 76 wherein the code module for displaying the representation of the multimedia information stored by the multimedia document in the first area of the GUI comprises:

4 a code module for displaying a first thumbnail image in the first area of the  
5 GUI, the first thumbnail image comprising the representation of information of the first type;  
6 and  
7 a code module for displaying a second thumbnail image in the first area of the  
8 GUI, the second thumbnail image comprising the representation of information of the second  
9 type.

1 78. The system of claim 76 wherein the code module for displaying, in the  
2 second area of the GUI, the representation of multimedia information displayed in the first  
3 portion of the first area comprises:

4 a code module for displaying the portion of the representation of information  
5 of the first type covered by the first lens in a first panel in the second area of the GUI; and  
6 a code module for displaying the portion of the representation of information  
7 of the second type covered by the first lens in a second panel in the second area of the GUI.

1 79. The system of claim 76 wherein the code module for displaying, in the  
2 second area of the GUI, the representation of multimedia information displayed in the first  
3 portion of the first area comprises:

4 a code module for determining a first time and a second time associated with  
5 the first lens;

6 a code module for displaying, in the second area of the GUI, a representation  
7 of information of the first type occurring between the first time and the second time  
8 associated with the first lens; and

9 a code module for displaying, in the second area of the GUI, a representation  
10 of information of the second type occurring between the first time and the second time  
11 associated with the first lens.

1 80. The system of claim 76 wherein the plurality of code modules further  
2 comprises:

3 a code module for receiving user input moving the first lens to cover a second  
4 portion of the first area; and

5 responsive to the user input, a code module for automatically changing the  
6 information displayed in the second area of the GUI such that the representation of  
7 multimedia information displayed in the second area of the GUI corresponds to the  
8 representation of multimedia information included in the second portion of the first area.

1                   81.     The system of claim 76 wherein the plurality of code modules further  
2 comprises:  
3                   a code module for displaying a second lens covering a first portion of the  
4 second area; and  
5                   a code module for displaying, in a third area of the GUI, a representation of  
6 multimedia information corresponding to the first portion of the second area, the  
7 representation of multimedia information displayed in the third area comprising a portion of  
8 the representation of information of the first type covered by the second lens and a portion of  
9 the representation of information of the second type covered by the second lens.

1                   82.     The system of claim 81 wherein the code module for displaying, in the  
2 third area of the GUI, the representation of multimedia information corresponding to the first  
3 portion of the second area comprises:  
4                   a code module for determining a first time and a second time associated with  
5 the second lens;  
6                   a code module for displaying, in the third area of the GUI, a representation of  
7 information of the first type occurring between the first time and the second time associated  
8 with the second lens; and  
9                   a code module for displaying, in the third area of the GUI, a representation of  
10 information of the second type occurring between the first time and the second time  
11 associated with the second lens.

1                   83.     The system of claim 81 wherein:  
2                   the code module for displaying the representation of the multimedia  
3 information stored by the multimedia document in the first area of the GUI comprises:  
4                   a code module for displaying a first thumbnail image in the first area of  
5 the GUI, the first thumbnail image comprising the representation of information of the first  
6 type; and  
7                   a code module for displaying a second thumbnail image in the first  
8 area of the GUI, the second thumbnail image comprising the representation of information of  
9 the second type;  
10                  the code module for displaying the representation of multimedia information  
11 displayed in the first portion of the first area in the second area of the GUI comprises:

12 a code module for displaying the portion of the representation of  
13 information of the first type covered by the first lens in a first panel in the second area of the  
14 GUI; and

15 a code module for displaying the portion of the representation of  
16 information of the second type covered by the first lens in a second panel in the second area  
17 of the GUI; and

18 the code module for displaying the representation of multimedia information  
19 corresponding to the first portion of the second area in the third area of the GUI comprises:

20 a code module for displaying the representation of information of the  
21 first type corresponding to the first portion of the second area of the GUI in a first sub-area of  
22 the third area of the GUI; and

23 a code module for displaying the representation of information of the  
24 second type corresponding to the first portion of the second area of the GUI in a second sub-  
25 area of the third area of the GUI.

1 84. The system of claim 81 wherein the plurality of code modules further  
2 comprises:

3 a code module for receiving a user input moving the second lens to cover a  
4 second portion of the second area; and

5 responsive to the user input, a code module for automatically changing the  
6 information displayed in the third area of the GUI such that the representation of multimedia  
7 information displayed in the third area of the GUI corresponds to the representation of the  
8 multimedia information included in the second portion of the second area.

1 85. The system of claim 81 wherein the plurality of code modules further  
2 comprises:

3 a code module for receiving a user input moving the first lens to cover a  
4 second portion of the first area; and

5 responsive to the user input, a code module for automatically:  
6 changing the information displayed in the second area of the GUI such  
7 that the representation of multimedia information displayed in the second area of the GUI  
8 corresponds to the representation of multimedia information included in the second portion of  
9 the first area; and

10 changing the information displayed in the third area of the GUI such  
11 that the representation of multimedia information displayed in the third area of the GUI  
12 corresponds to the representation of the multimedia information included in the second  
13 portion of the second area.

1 86. The system of claim 81 wherein the plurality of code modules further  
2 comprises:  
3 a code module for displaying a sub-lens covering a portion of the first area of  
4 the GUI corresponding to the first portion of the second area of the GUI covered by the  
5 second lens.

1 87. The system of claim 86 wherein the plurality of code modules further  
2 comprises:  
3 a code module for receiving a user input moving the second lens to cover a  
4 second portion of the second area; and  
5 responsive to the user input, a code module for automatically changing a  
6 position of the sub-lens to cover a portion of the first area of the GUI corresponding to the  
7 second portion of the second area.

1 88. The system of claim 76 wherein:  
2 the information of the first type corresponds to video information; and  
3 the representation of the information of the first type comprises one or more  
4 video keyframes extracted from the video information.

1 89. The system of claim 88 wherein:  
2 the information of the second type corresponds to audio information; and  
3 the representation of information of the second type comprises text  
4 information obtained from transcribing the audio information.

1 90. The system of claim 88 wherein:  
2 the information of the second type corresponds to closed-caption (CC) text  
3 information; and  
4 the representation of information of the second type comprises text  
5 information included in the CC text information.

1                   91.     The system of claim 76 wherein the plurality of code modules further  
2 comprises:  
3                   a code module for receiving information indicating a user-specified concept of  
4 interest; and  
5                   a code module for analyzing the multimedia information stored in the  
6 multimedia document to identify one or more locations in the multimedia information that are  
7 relevant to the user-specified concept of interest;  
8                   wherein the code module for displaying the representation of multimedia  
9 information in the first area of the GUI comprises a code module for annotating the one or  
10 more locations in the multimedia information that are relevant to the user-specified concept  
11 of interest; and  
12                   wherein the code module for displaying, in the second area of the GUI, a  
13 representation of multimedia information displayed in the first portion of the first area  
14 comprises a code module for annotating the one or more locations in the multimedia  
15 information that are relevant to the user-specified concept of interest and that are located in  
16 the first portion of the first area.

1                   92.     The system of claim 76 wherein the plurality of code modules further  
2 comprises:  
3                   a code module for receiving input indicating selection of a portion of the  
4 multimedia information occurring between a first time and a second time; and  
5                   a code module for performing a first operation on the portion of the  
6 multimedia information occurring between a first time and a second time.

1                   93.     A system for displaying multimedia information stored in a multimedia  
2 document, the multimedia information comprising information of a first type and information  
3 of a second type, the system comprising:  
4                   a display;  
5                   a processor; and  
6                   a memory coupled to the processor, the memory configured to store a plurality  
7 of code modules for execution by the processor, the plurality of code modules comprising:  
8                   a code module for displaying a graphical user interface (GUI) on the  
9 display;

10 a code module for displaying, in a first area of the GUI, a  
11 representation of the multimedia information stored by the multimedia document occurring  
12 between a start time ( $t_s$ ) and an end time ( $t_e$ ) associated with the multimedia document, the  
13 displayed representation of the multimedia information comprising a representation of  
14 information of the first type occurring between  $t_s$  and  $t_e$  and a representation of information of  
15 the second type occurring between  $t_s$  and  $t_e$ , where ( $t_e > t_s$ );

16 a code module for displaying a first lens emphasizing a portion of the  
17 first area of the GUI, the portion of the first area emphasized by the first lens comprising a  
18 representation of multimedia information occurring between a first time ( $t_1$ ) and a second  
19 time ( $t_2$ ), where ( $t_s \leq t_1 < t_2 \leq t_e$ ); and

20 a code module for displaying, in a second area of the GUI, the  
21 representation of multimedia information occurring between  $t_1$  and  $t_2$ , the representation of  
22 multimedia information displayed in the second area comprising a representation of  
23 information of the first type occurring between  $t_1$  and  $t_2$  and a representation of information  
24 of the second type occurring between  $t_1$  and  $t_2$ .

1 94. The system of claim 93 wherein the plurality of code modules further  
2 comprises:

3 a code module for displaying a second lens emphasizing a portion of the  
4 second area of the GUI, the portion of the second area emphasized by the second lens  
5 comprising a representation of multimedia information occurring between a third time ( $t_3$ )  
6 and a fourth time ( $t_4$ ), where ( $t_1 \leq t_3 < t_4 \leq t_2$ ); and

7 a code module for displaying, in a third area of the GUI, the representation of  
8 multimedia information occurring between  $t_3$  and  $t_4$ , the representation of multimedia  
9 information displayed in the third area comprising a representation of information of the first  
10 type occurring between  $t_3$  and  $t_4$  and a representation of information of the second type  
11 occurring between  $t_3$  and  $t_4$ .

1 95. The system of claim 94 wherein the plurality of code modules further  
2 comprises:

3 a code module for changing the position of the first lens in response to user  
4 input such that the first lens emphasizes a portion of the first area of the GUI comprising a  
5 representation of multimedia information occurring between a fifth time ( $t_5$ ) and a sixth time  
6 ( $t_6$ ), where ( $t_s \leq t_5 < t_6 \leq t_e$ ), ( $t_5 \neq t_1$ ), and ( $t_6 \neq t_2$ ); and

7 responsive to the change in the position of the first lens, a code module for  
8 automatically displaying, in the second area of the GUI, the representation of multimedia  
9 information occurring between  $t_5$  and  $t_6$ , the representation of multimedia information  
10 displayed in the second area comprising a representation of information of the first type  
11 occurring between  $t_5$  and  $t_6$  and a representation of information of the second type occurring  
12 between  $t_5$  and  $t_6$ .

1 96. The system of claim 94 wherein the plurality of code modules further  
2 comprises:

3 a code module for changing the position of the second lens in response to user  
4 input such that the second lens emphasizes a portion of the second area of the GUI  
5 comprising a representation of multimedia information occurring between a fifth time ( $t_5$ ) and  
6 a sixth time ( $t_6$ ), where ( $t_1 \leq t_5 < t_6 \leq t_2$ ), ( $t_5 \neq t_3$ ), and ( $t_6 \neq t_4$ ); and

7 responsive to the change in the position of the second lens, a code module for  
8 automatically displaying, in the third area of the GUI, the representation of multimedia  
9 information occurring between  $t_5$  and  $t_6$ , the representation of multimedia information  
10 displayed in the third area comprising a representation of information of the first type  
11 occurring between  $t_5$  and  $t_6$  and a representation of information of the second type occurring  
12 between  $t_5$  and  $t_6$ .

1 97. The system of claim 94 wherein the plurality of code modules further  
2 comprises:

3 a code module for displaying a third lens emphasizing a portion of the first  
4 area of the GUI comprising a representation of multimedia information occurring between  $t_3$   
5 and  $t_4$ .

1 98. The system of claim 97 wherein the plurality of code modules further  
2 comprises:

3 a code module for changing the position of the second lens in response to user  
4 input such that the second lens emphasizes a portion of the second area of the GUI  
5 comprising a representation of multimedia information occurring between a fifth time ( $t_5$ ) and  
6 a sixth time ( $t_6$ ), where ( $t_1 \leq t_5 < t_6 \leq t_2$ ), ( $t_5 \neq t_3$ ), and ( $t_6 \neq t_4$ ); and

7 responsive to the change in the position of the second lens, a code module for  
8 automatically changing the position of the third lens such that the third lens emphasizes a



9 portion of the first area of the GUI comprising a representation of multimedia information  
10 occurring between  $t_5$  and  $t_6$ .

1 99. The system of claim 93 wherein:  
2 the information of the first type is video information;  
3 the information of the second type is audio information;  
4 the representation of the information of the first type comprises one or more  
5 video keyframes extracted from the video information; and  
6 the representation of information of the second type comprises text  
7 information obtained from transcribing the audio information.

1 100. The system of claim 93 wherein:  
2 the information of the first type is video information;  
3 the information of the second type is closed-caption (CC) text information;  
4 the representation of the information of the first type comprises one or more  
5 video keyframes extracted from the video information; and  
6 the representation of the information of the second type comprises text  
7 information included in the CC text information.

1 101. The system of claim 93 wherein the plurality of code modules further  
2 comprises:  
3 a code module for receiving information indicating a first topic; and  
4 a code module for analyzing the multimedia information stored in the  
5 multimedia document to identify one or more locations in the multimedia information that are  
6 relevant to the first topic;  
7 wherein the code module for displaying the representation of the multimedia  
8 information stored by the multimedia document occurring between  $t_5$  and  $t_6$  in the first area of  
9 the GUI comprises a code module for highlighting the one or more locations in the  
10 multimedia information displayed in the first area of the GUI; and  
11 wherein the code module for displaying the representation of multimedia  
12 information occurring between  $t_1$  and  $t_2$  in the second area of the GUI comprises a code  
13 module for highlighting the one or more locations in the multimedia information that occur  
14 between times  $t_1$  and  $t_2$ .

102. The system of claim 93 wherein the plurality of code modules further comprises:  
a code module for receiving input indicating selection of a portion of the multimedia information occurring between a selection start time and a selection end time; and  
a code module for performing a first operation on the portion of the multimedia information occurring between the selection start time and the selection end time.

103. A system of displaying multimedia information stored in a multimedia document on a display, the multimedia information comprising video information and information of a first type, the system comprising:

a display;  
a processor; and  
a memory coupled to the processor, the memory configured to store a computer program;

wherein the processor is operative with the computer program to:

display a graphical user interface (GUI) on the display;  
display, in a first section of a first area of the GUI, a first set of one or more video keyframes extracted from the video information occurring between a start time ( $t_s$ ) and an end time ( $t_e$ ) associated with the multimedia document, where ( $t_e > t_s$ );  
display, in a second section of the first area of the GUI, text information corresponding to the information of the first type occurring between  $t_s$  and  $t_e$ ;  
display a first lens emphasizing a portion of the first section of the first area occurring between a first time ( $t_1$ ) and a second time ( $t_2$ ) and a portion of the second section of the first area occurring between  $t_1$  and  $t_2$ , the emphasized portion of the first section of the first area comprising a second set of one or more video keyframes extracted from the video information occurring between  $t_1$  and  $t_2$ , the emphasized portion of the second section of the first area comprising text information corresponding to information of the first type occurring between  $t_1$  and  $t_2$ , wherein the second set of one or more keyframes is a subset of the first set of one or more keyframes and ( $t_s \leq t_1 < t_2 \leq t_e$ );  
display the second set of one or more keyframes in a first section of a second area of the GUI; and  
display text information corresponding to the information of the first type occurring between  $t_1$  and  $t_2$  in a second section of the second area of the GUI.

104. The system of claim 103 wherein the processor is operative with the computer program to:

display a second lens emphasizing a portion of the first section of the second area and a portion of the second section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset of the second set of one or more video keyframes and ( $t_1 \leq t_3 < t_4 \leq t_2$ );

display a keyframe from the third set of one or more keyframes in a first section of a third area of the GUI; and

display text information corresponding to the information of the first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI.

105. The system of claim 103 wherein the processor is operative with the computer program to:

display a second lens emphasizing a portion of the first section of the second area and a portion of the second section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset of the second set of one or more video keyframes and ( $t_1 \leq t_3 < t_4 \leq t_2$ );

output video information starting from  $t_3$  or from  $t_4$  or from a time between  $t_3$  and  $t_4$  in a first section of a third area of the GUI; and

display text information corresponding to the information of the first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI.

106. The system of claim 103 wherein the information of the first type is audio information, and the text information corresponding to the information of the first type is obtained from transcribing the audio information.

107. The system of claim 103 wherein the information of the first type is closed-caption (CC) text information, and the text information corresponding to the information of the first type is extracted from the CC text information.

108. The system of claim 103 wherein the multimedia information stored by the multimedia document further comprises slides information, and wherein the processor is operative with the computer program to:

display, in a third section of the first area of the GUI, a first set of one or more slides extracted from the slides information occurring between  $t_s$  and  $t_e$ , wherein the first lens emphasizes a portion of the third section of the first area comprising a second set of one or more slides extracted from the slides information occurring between  $t_1$  and  $t_2$ , the second set of one or more slides is a subset of the first set of one or more slides; and

display the second set of one or more slides in a third section of the second area of the GUI

109. The system of claim 108 wherein the processor is operative with the computer program to:

display a second lens emphasizing a portion of the first section of the second area, a portion of the second section of the second area, and a portion of the third section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ , the emphasized portion of the third section of the second area comprising a third set of one or more slides extracted from the slides information occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset of the second set of one or more video keyframes, the third set of one or more slides is a subset of the second set of one or more slides, and  $(t_1 \leq t_3 < t_4 \leq t_2)$ ;

display at least one keyframe from the third set of one or more video keyframes in a first section of a third area of the GUI;

display text information corresponding to the information of the first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI; and

display at least one slide from the third set of one or more slides in a third section of the third area of the GUI.

110. The system of claim 103 wherein the multimedia information stored by the multimedia document further comprises whiteboard images information, and wherein the processor is operative with the computer program to:

display, in a third section of the first area of the GUI, a first set of one or more whiteboard images extracted from the whiteboard images information occurring between  $t_s$  and  $t_e$ , wherein the first lens emphasizes a portion of the third section of the first area comprising a second set of one or more whiteboard images extracted from the whiteboard images information occurring between  $t_1$  and  $t_2$ , the second set of one or more whiteboard images is a subset of the first set of one or more whiteboard images; and

display the second set of one or more whiteboard images in a third section of the second area of the GUI.

111. The system of claim 110 wherein the processor is operative with the computer program to:

display a second lens emphasizing a portion of the first section of the second area, a portion of the second section of the second area, and a portion of the third section of the second area, the emphasized portion of the first section of the second area comprising a third set of one or more video keyframes extracted from the video information occurring between a third time ( $t_3$ ) and a fourth time ( $t_4$ ), the emphasized portion of the second section of the second area comprising text information corresponding to information of the first type occurring between  $t_3$  and  $t_4$ , the emphasized portion of the third section of the second area comprising a third set of one or more whiteboard images extracted from the whiteboard images information occurring between  $t_3$  and  $t_4$ , wherein the third set of one or more video keyframes is a subset of the second set of one or more video keyframes, the third set of one or more whiteboard images is a subset of the second set of one or more whiteboard images, and  $(t_1 \leq t_3 < t_4 \leq t_2)$ ;

display at least one keyframe from the third set of one or more video keyframes in a first section of a third area of the GUI;

display text information corresponding to the information of the first type occurring between  $t_3$  and  $t_4$  in a second section of the third area of the GUI; and

display a whiteboard images from the third set of one or more whiteboard images in a third section of the third area of the GUI.